UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL EXPOSURE RESEARCH LABORATORY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
RESEARCH AND DEVELOPMENT

July 26, 2017

MEMORANDUM

SUBJECT: Laboratory Results for GenX (Rounds 4 & 5) NC DEQ Cape Fear Watershed Sampling

FROM: Timothy J. Buckley, Director
Exposure Methods and Measurements Division

THRU: Jennifer Orme-Zavaleta, Director

TO: Linda Culpepper, Deputy Director
Division of Water Resources
North Carolina Department of Environmental Quality

Per your request of June 9, 2017, I am pleased to provide you with the laboratory analysis results for the concentration of GenX in water samples collected by NC DEQ. These results are for the fourth and fifth weeks of sampling. Samples were received by our laboratory on July 14th and 21st for each of these two rounds of weekly sampling. It is our understanding that we will be receiving and analyzing samples from one more week of sampling as well as some additional daily samples (Mon – Fri) from the Chemours outfall. Results from these additional sampling rounds will be reported separately as they become available. We will also report semi-quantitative concentrations of additional PFAS analytes in a later report.

Each round of sampling consisted of a number of sites selected by NC DEQ that included a variety of water types: effluent, source, drinking, and well waters. Sampling rounds 4 and 5 also included field blanks and spikes that were provided by our laboratory for quality control purposes. It is our understanding that duplicate samples were collected at each site. One of the duplicates was provided to our laboratory with the second sample being provided to a contract laboratory, Test America (Denver, Colorado), for GenX analysis. In rounds 4 and 5, Test America was also provided with field blanks and spikes that were prepared by our laboratory. Results from these QC samples will provide the basis for comparing our results with Test America. Our laboratory methods for this analysis are described in Sun *et al.,* 2016[1] and Strynar *et al.,* 2015[2]. Because of an instrument failure of our Ultra High Pressure Liquid

[1] Sun M; Arevalo E; Strynar M; Lindstrom A; Richardson M; Kearns B; Pickett A; Smith C; Knappe DRU: Legacy and Emerging Perfluoroalkyl Substances Are Important Drinking Water Contaminants in the Cape Fear River Watershed of North Carolina. Environmental Science & Technology Letters. 2016

[2]Strynar M, Dagnino S, McMahen R, Liang S, Lindstrom A, Andersen E, McMillan L, Thurman M, Ferrer I, Ball C. Identification of Novel Perfluoroalkyl Ether Carboxylic Acids (PFECAs) and Sulfonic Acids (PFESAs) in Natural Waters Using Accurate Mass Time-of-Flight Mass Spectrometry (TOFMS). Environ Sci Technol. 2015

Chromatography Mass Spectrometry/Mass Spectrometry (UPLC-MS/MS), week 5 samples were run on a High Resolution Mass Spectrometer. The change in instrument had no impact on our ability to quantify GenX in the samples analyzed.

The following provides a brief summary of results.

- GenX concentrations ranged from below our limit of quantitation (5 samples) to 2,430 ng/L (DWR #1-Chemours Outfall 002).
- GenX concentrations in weeks 4 & 5 are generally lower that what was observed in weeks 1-3.
    - The number of samples below the limit of quantitation increased from 1 to 5;
    - Peak concentrations observed at the Chemours outfall decreased nearly 10-fold from 21,760 to 2,430 ng/L;
    - The median value decreased more than 2-fold from 136 to 64.4 ng/L.
- Some samples exceeded our calibration curve (n=3). These samples were diluted and the analysis was repeated. The dilution procedure introduces some additional uncertainty in our quantification. We have flagged results for samples that required dilution.
- Quality control samples indicated measurements were within our quality control specifications with one exception noted below.
    - GenX was not detected in either of the two field blanks;
    - Spiked field samples (n=3) were measured within 13 percent of the expected value. One low-level spike sample (50 ng/L) was measured at 29.0 ng/L which was outside of our 20 percent range.
    - Duplicate precision on one sample (Chemours outfall 5x dilution) was 5.4% RSD.

Despite the one low-level spike deviation, we have high confidence in the concentration results reported here.

Thank you for inviting us to be a part of this effort that addresses a very important public health concern in North Carolina. These results represent the effort of many within our lab but I would especially like to acknowledge Drs. Mark Strynar, Andy Lindstrom, James McCord and Seth Newton in conducting the laboratory analyses, Dr. Myriam Medina-Vera who provided invaluable support and coordination, and Ms. Sania Tong Argao who supported and oversaw quality assurance.

If you have any questions or concerns, do not hesitate to contact me at (919) 541-2454 or email [HYPERLINK "mailto:buckley.timothy@epa.gov"]. I look forward to our continued work together.

Attachment

CC: Becky B. Allenbach, Acting Deputy Director
Water Protection Division, EPA Region 4 – Atlanta

Week	Location / Sample Identifier	Conc. (ng/L)	Flag
4	DWR #1- Chemours Outfall 002	2,430	1
4	DWR #2 - Bladen Bluffs Raw water intake	76.5	
4	DWR #3 PO Hoffer WTP Raw Water	<LOQ	2
4	NCDEQ 1 LCFWSA Raw	88.2	
4	NCDEQ 2 Sweeny Finished	80.5	
4	NCDEQ 3 ASR Well	83.7	
4	NCDEQ 4 Wrightsville Beach Well #11	<LOQ	2
4	NCDEQ 5 International Paper Raw	59.7	
4	NCDEQ 1 LCFWSA DUPLICATE	88.5	
4	NCDEQ 6 International Paper Finished	17.0	
4	NCDEQ 7 NW Brunswick WTP Finished	50.7	1
4	NCDEQ 8 Pender CO 421 WTP Finished	75.0	
5	DWR #1 PO Hoffer Raw	<LOQ	2
5	DWR #2 Chemours Outfall 002	713	1
5	DWR #3 Bladen Bluffs Raw water	54.1	
5	DWR #4 Bladen Bluffs Finished Water	58.9	
5	DWR #5 Smithfield Foods well field	<LOQ	2
5	NCDEQ 1 LCFWA raw	57.7	
5	NCDEQ 2 Sweeney WTP finished	95.0	
5	NCDEQ 3 ASR well	94.1	
5	NCDEQ 4 WB Well #11	37.1	
5	NCDEQ 5 IP - Raw	74.2	
5	NCDEQ 6 IP - Finished	34.1	
5	NCDEQ 7 NW Brunswick WTP – Finished	69.2	
5	NCDEQ 8 Pender 421 WTP - Finished	99.9	
5	NCDEQ 9 WB Well #6	<LOQ	2

Flags

1 Sample diluted 20X

2 Below limit of quantitation of 10 ng/L